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Current techniques and practices for concrete rehabilitation are largely borrowed from those of new construction. Rehabilitation and new construction, however, differ from each other in several respects, including project scale, technology management and financing. The use of proper technical and administrative procedures in repair and restoration are critical to success, yet these procedures are not well defined by current codes and standards.

One of the challenges in repair and restoration work is to accomplish it safely and efficiently so that the facility can still be used. This operational reality may dominate technical, scheduling and logistic considerations. Furthermore, the repair location is typically confined or cramped, and may be inaccessible to work crews using standard construction equipment and technology. If the work must be done during off-peak hours, scheduling and quality control are affected.

Designers can make the greatest contribution to minimise the cost and disruption associated with maintenance and repair. However, at present, their contribution is not as effective as it should be in this domain because of their failure to appreciate the interrelated causes of concrete degradation and the complexity of the repair process. These causes of concrete degradation include unsatisfactory detailing, incorrect selection or specification of materials, components and systems, and a lack of understanding of how a structure will be used and maintained.

Concrete repair requires a wide range of materials with different physical and chemical properties, and application techniques. Compatibility with the original substrate, ease of use in a wide variety of situations, and structural considerations are all crucial to effecting a successful repair. Despite these accepted principles, many architects and engineers design repair projects without sufficient knowledge of the materials they specify or without understanding the significance of compatibility between repair materials and the substrate.

Surveys of existing conditions (for measuring the extent of deterioration) employ rudimentary diagnostic tools that do not yield the information required to carry out the repair effectively. With insufficient knowledge and inadequate analysis of the problem, the validity of the diagnosis would be doubtful, thus contributing to ambiguity and error in the design of the repair programme.

The design of concrete restoration is many times undertaken by the untrained or poorly informed whose fears of liability are realistic. However, these fears, in combination with a lack of comprehensive knowledge, can result in the specification of materials and procedures which create new problems in addition to the initial ones which have not been adequately addressed.

As a result of the inadequacies in current concrete repair and rehabilitation practices (described above), many concrete restorations are required to be redone later at considerable cost. This phenomena is reflected in the fact that much more money (100,000 times) is spent annually on damage awards from concrete-deterioration litigation than is spent on researching repair degradation.

The development of performance standards for concrete repair has not kept pace with the development of materials, primarily because of a lack of supporting scientific and field data. It seems clear that research must be undertaken to help find a more direct means for linking the properties of repair materials with the quality and performance of what is actually produced in the field in order to reduce the uncertainties of the repair process.

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